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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RUIZHONG HU, XINJIN ZHAO, RICHARD FRANKLIN
WORMSBECHER and MICHAEL SCOTT ZIEBARTH

Appeal 2010-001465
Application 10/801,424
Technology Center 1700

Before CHUNG K. PAK, CHARLES F. WARREN, and
CATHERINE Q. TIMM, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's refusal to allow claims 1 through 29 and 31 through 44. Claims 45 through 71, the other claims pending in the above-identified application, stand withdrawn from consideration by the Examiner. We have jurisdiction under 35 U.S.C. § 6.

STATEMENT OF THE CASE

The subject matter on appeal is directed to a fluidizable cracking catalyst composition comprising a zeolite, a Lewis Acid-containing component, and an inorganic oxide matrix, with Na_2O being 0.20 percent by weight or less based on the total composition. (See claim 1 and Spec. 6, para. 0019). According to page 6, paragraph 0019, of the Specification,

This invention is based on the discovery that sodium affects the Lewis Acid sites believed to be responsible for catalyzing sulfur reduction brought about by Lewis Acid-based gasoline sulfur reduction additives. The Na_2O content in the catalyst of this invention is generally 0.20% or less. It has been discovered that if the Na_2O level of the catalyst composition is relatively greater than that, the number of Lewis Acid sites in the composition is significantly reduced and therefore there is a decrease in the ability of the composition to reduce gasoline sulfur.

The Specification shows the importance of treating zeolite and matrix components, e.g., zeolites and alumina sources, to reduce Na_2O contents and/or identifying zeolite and matrix components having little Na_2O contents for inclusion in the catalyst composition. (See Spec. 9-10, paras. 0030-0034 and Spec. 14, paras. 0048 and 0049.) Example 1, at pages 20 through 23 of the Specification, shows that the Na_2O level in the cracking catalyst composition has a significant effect on the sulfur reduction during the FCC (fluidized catalyst cracking) process. (See also Spec. 20 and 21, Tables 1 and 2.)

Details of the appealed subject matter are recited in representative claim 1 reproduced from the Claims Appendix to the Appeal Brief (“App. Br.”) filed March 20, 2009 as shown below:

1. A cracking catalyst composition capable of being maintained in a fluidized state within a fluid cracking catalyst unit used in cracking hydrocarbon feedstock containing organic sulfur containing compounds, the cracking catalyst composition comprising

- (a) Zeolite;
- (b) Lewis Acid-containing component; and
- (c) inorganic oxide matrix;

wherein the cracking catalyst composition further comprises 0.20 percent by weight Na_2O or less, and wherein the average particle size of the cracking catalyst composition is in the range of 20 to 150 microns.

As evidence of unpatentability of the claimed subject matter, the Examiner relies on the following references at page 3 of the Answer (“Ans.”) filed dated November 10, 2009:

Chen	US 4,627,911	Dec. 9, 1986
Nakaoka	US 5,686,374	Nov. 11, 1997

As evidence of patentability of the claimed subject matter, Appellants rely on the following references (App. Br. 38):

Penick	US 4,705,621	Nov. 10, 1987
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Kunii et al., *Fluidization Engineering*, 2nd Ed., Butterworth-Heinmann, a division of Reed Publishing Inc. (1991), pp. 77-79 and 93 (hereinafter referred to as “Kunii”)

Magee et al., *Fluid Catalytic Cracking: Science and Technology*, Elsevier Science Publishers B.V. (1993), pp. 339-346 (hereinafter referred to as “Magee”).

Appellants request review of the Examiner's rejection of claims 1 through 29 and 31 through 44 as unpatentable over the combined disclosures of Nakaoka and Chen (App. Br. 5).

RELEVANT FACTUAL FINDINGS, PRINCIPLES OF LAW, ISSUE
AND CONCLUSION

The Examiner has the initial burden of establishing a *prima facie* case of obviousness. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). To carry that burden, the Examiner relies upon Nakaoka for the claimed cracking catalyst composition and Chen for the claimed cracking catalyst particle sizes (Ans. 3-5). On the other hand, Appellants contend, *inter alia*, that the Examiner has not demonstrated that Nakaoka teaches or would have suggested a cracking catalyst composition having the claimed ingredients, including the claimed sodium content (App. Br. 16-18).

Thus, the dispositive question raised here is: Have Appellants shown that the Examiner erred in finding that Nakaoka teaches or would have suggested a cracking catalyst composition comprising a zeolite, a Lewis Acid-containing component, and an inorganic oxide matrix, with Na₂O being 0.20 percent by weight or less based on the total composition within the meaning of 35 U.S.C. § 103(a)? On this record, we answer this question in the affirmative.

As found by the Examiner at page 3 of the Answer, Nakaoka exemplifies catalyst compositions having 58.2 to 75% by weight of alumina corresponding to the claimed matrix, 15 to 30% by weight of Y type zeolite and 2 to 5% by weight of zinc oxide corresponding to the claimed Lewis Acid-containing component. (*See also* col. 9, Table 2, Examples 1-6.) According to col. 2, ll. 51-61, of Nakaoka, Y type zeolite is treated to reduce

its alkali (e.g., sodium) content to 0.5% by weight or less to stabilize the crystal structure of Y type zeolite. However, the Examiner has not shown that Nakaoka inherently or expressly teaches or would have suggested employing an alumina having a very low alkali (sodium) content in its catalyst composition to arrive at the claimed catalyst having 0.20 weight percent or less sodium content. In particular, the Examiner has not shown that Nakaoka teaches or would have suggested treating an alumina to reduce the alkali (sodium) content or identifying an alumina having low or no alkali (sodium) content for inclusion in its catalyst composition. Nor has the Examiner shown that Nakaoka teaches or suggests the importance of reducing the alkali (sodium) content in its catalyst composition.

It follows that Appellants have shown that the Examiner erred in finding that Nakaoka teaches or would have suggested a cracking catalyst composition comprising a zeolite, a Lewis Acid-containing component, and an inorganic oxide matrix, with Na_2O being 0.20 percent by weight or less based on the total composition within the meaning of 35 U.S.C. § 103(a).

ORDER

Upon consideration of the record, and for the reasons given, it is ORDERED that the decision of the Examiner to reject claims 1 through 29 and 31 through 44 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Nakaoka and Chen is REVERSED.

REVERSED

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